IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Farid Ahmed-Zaid, et al.

Serial No.:	10/063,498	Group Art Unit: 3661
Filed:	April 30, 2002	Examiner: Hernandez, Olga
Title:	OBJECT DETECTION IN ADAPTIVE CRUISE CONTROL	

Atty. Docket No.: 199-1941 (FGT 1503 PA)

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APPEAL BRIEF

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Dear Madam:

The following Appeal Brief is submitted pursuant to the Notice of Appeal filed April 18, 2005, in the above-identified application.

I Real Party in Interest

The real party in interest in this matter is Ford Global Technology, LLC, which is a wholly owned subsidiary of Ford Motor Company both in Dearborn, Michigan (hereinafter "Ford").

II Related Appeals and Interferences

There are no other known appeals or interferences, which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III Status of the Claims

Claims 1-11 and 13-19 are currently pending. Claims 12 and 20 have been canceled. Claims 1-11 and 13-19 stand under final rejection, from which this appeal is taken. A copy of the claims on appeal is attached as an Appendix A.

IV Status of Amendments

The independent claims 1, 11, 16, and 19 were amended in response to the Non-Final Office Action of July 30, 2004, post the First Appeal Brief of December 16, 2003, and post the Request for Continued Examination filed July 6, 2004. In the Response of October 19, 2004 remarks were provided for the allowance of all currently pending claims. In Response to the Final Office Action of February 4, 2005, claims 1 and 11 were amended for a minor clarification reason. In the Response of March 31, 2005 remarks were further provided for the allowance of all currently pending claims regardless of whether the minor clarification amendments of the March 31st Response were entered. There have been no amendments filed subsequent to the March 31st Response. Since the March 31st amendments have not been entered as denoted in the Advisory Action of April 12, 2005, this Appeal is taken from the state of the claims prior to or, in other words, without such March 31st amendments. The status of the claims prior to the March 31st amendments is provided in Appendix A.

V Summary of Claimed Subject Matter

By way of summary, the present invention is directed to methods and systems for adaptively controlling the speed of a vehicle. Claims 1, 11, 16, and 19 encompass several points of novelty, and since claims 2-10, 13-15, and 17-18 depend from claims 1, 11, and 16, respectively, they also contain at least the same points of novelty. Independent claims 1 and 16 are similar and are therefore described together. Similarly, independent claims 11 and 19 are similar and are therefore described together.

Claims 1 and 16 recite a method and system 20 for adaptively controlling the speed of a vehicle 22. An object is detected and an object profile is generated. A navigation signal is generated by a navigation system 34. In the method of claim 1 a non-planned future path of the vehicle 22 is detected in response to the navigation signal. An in-vehicle controller 24 generates a predicted future path profile in response to the non-planned future path and the object profile. In the system 20 of claim 16 the controller 24 generates a predicted future path profile in response to the object profile and the navigation signal. In both the method of claim 1 and the system 20 of claim 16 the resume speed of the vehicle 22 is inhibited in response to the predicted future path profile and a command originated and generated by the controller 24. See page 9-18, paragraphs [0025], [0028], [0029], [0032], [0033], [0036], and [0037] of the specification.

The method and system of claims 1 and 16 also allow a controller 24 to inhibit the resume speed of a vehicle 22 when driving on a curved road, as well as on a non-curved road. The method and system of claims 1 and 16 inhibit the resume speed in response to a predicted future path profile, instead of the yaw rate of the vehicle 22. In so doing, the controller 24 prevents the host vehicle 22 from accelerating when a target vehicle is no longer detected or when a target vehicle is stopped and is in the future path of the host vehicle 22, thereby, also preventing a collision between the host vehicle 22 and the target vehicle.

Applicants admit that the prior art has included a monitoring system for remotely controlling multiple vehicles to follow planned or predetermined traveling paths. Applicants also admit that the prior art has disclosed limiting vehicle speed in response to yaw rate of that vehicle. What is not known or suggested are the several novel limitations recited in claims 1 and 16 and associated aspects thereof, which are utilized in combination. All of the novel limitations of claims 1 and 16 are not taught or suggested by the prior art separately or in combination. The limitations are stated in detail below.

What is not known or suggested is the detection of a non-planned future path of a vehicle in response to a navigation signal. What is also not known or suggested is the generation of a predicted future path profile of a host vehicle in response to the non-planned future path of a host vehicle and an object profile. Additionally, it is further not known or suggested is the generation of a predicted future path profile of a host vehicle in response to an object profile and a navigation signal. Furthermore, it is not known or suggested that a resume speed of a host vehicle be inhibited in response to the predicted future path profile. Moreover, it is not known or suggested that the performed tasks of generating a predicted future path profile and inhibiting the resume speed of a vehicle be performed via an in-vehicle controller. Once more, it is not known or suggested that the inhibition of a resume speed be performed in response to a command originated and generated by an in-vehicle controller.

Claim 2 recites the method of claim 1 and further includes continuously updating the predicted future path profile. See pages 17-19, paragraphs [0037] and [0038] of the specification.

Claim 3 recites the method of claim 2 wherein updating the predicted future path profile includes updating parameters selected from: an object profile, a yaw rate, a street category, and upcoming future road paths. See pages 17-18, paragraph [0037] of the specification.

Claim 4 recites the method of claim 1 and further includes determining that the object is a stopped object, adjusting automotive vehicle speed in relation to the stopped object, and maintaining a safe operating distance between the automotive vehicle 22 and the stopped object. See pages 11-12, paragraphs [0030] and [0031], and pages 17-18, paragraph [0037] of the specification.

Claim 5 recites the method of claim 1 and further includes assuming a future road condition to have a road curvature, a speed category, a number of lanes, or a road inclination that is the same as a present road condition. See page 10, paragraph [0028] and pages 12-13, paragraph [0032].

Claim 6 recites the method of claim 1 wherein detecting the non-planned future path of the automotive vehicle 22 includes sensing yaw rate of the automotive vehicle 22 and generating a yaw rate signal, relating the yaw rate to a road curvature, and inhibiting resume speed of the automotive vehicle 22 in response to the yaw rate signal. See pages 9-15, paragraphs [0026], [0029], [0032], and [0033], and pages 17-18, paragraph [0037] of the specification.

Claim 7 recites the method of claim 1 wherein detecting the non-planned future path of the automotive vehicle 22 includes using a navigation system 34 to generate a navigation signal using information selected from: an automotive vehicle position, a speed category, a future path of the automotive vehicle 22, a landmark location, a road curvature, an overhead object location, a bridge location, a construction zone, a number of lanes, a road type, and a road inclination. See page 10, paragraph [0028] of the specification.

Claim 8 recites the method of claim 1 wherein generating an object profile includes storing object parameters selected from: relative distance from the automotive vehicle 22, object location relative to a road, and velocity of the object relative to the automotive vehicle velocity. See page 9, paragraph [0025] of the specification.

Claim 9 recites the method of claim 1 wherein generating a predicted future path profile further includes determining object location with respect to the non-planned future path. See pages 17-18, paragraph [0037] of the specification.

Claim 10 recites the method of claim 1 wherein inhibiting the resume speed of the automotive vehicle 22 further includes inhibiting resume speed of the automotive vehicle 22 in response to a parameter selected from: a road curvature, a speed category, a number of lanes, and a constant road inclination. See page 10, paragraph [0028] of the specification.

Claim 17 recites the system of claim 16 wherein the controller 24 in generating a predicted future path profile determines an object location with respect to the non-planned future path. See pages 17-18, paragraph [0037] of the specification.

Claim 18 recites the system of claim 16 wherein the controller 24 determines the object to be a stopped object and adjusts the speed of the automotive vehicle 22 in relation to the stopped object. See pages 11-12, paragraphs [0030] and [0031], and pages 17-18, paragraph [0037] of the specification.

Claim 11 recites a method for adaptively controlling the speed of a vehicle 22 having a controller 24. An object is detected and an object profile is generated. A non-planned future path of the vehicle 22 is detected and a predicted future path profile is generated via the controller 24. A future road condition is assumed to be the same as a present road condition. Yaw rate of the vehicle 22 is sensed and a yaw rate signal is generated. The resume speed of the vehicle 22 is inhibited by preventing the acceleration of the vehicle in response to the object profile, the assumption, the predicted future path profile, the yaw rate signal, and a command originated and generated by the controller 24. See page 9-18, paragraphs [0025], [0026], [0028], [0029], [0032], [0033], [0036], [0037] of the specification.

Claim 19 recites a system 20 for adaptively controlling the speed of a vehicle 22 having a controller 24. An object is detected and an object profile is generated. The object is detected via a radar system 28. A navigation system 34 generates a

navigation signal. A yaw rate sensor 30 generates a yaw rate signal. The controller 24 in response to the object profile and the navigation signal generates a predicted future path profile. The controller 24 inhibits the resume speed of the vehicle 22 by preventing acceleration of the vehicle 22 in response to the predicted future path profile, the yaw rate signal, and a command generated by the controller 24. See page 9-18, paragraphs [0025], [0026], [0028], [0029], [0032], [0033], [0036], [0037] of the specification.

The method and system 20 of claims 11 and 19 allow, for example, a vehicle controller 24 to inhibit resume speed of a host vehicle 22 when driving on a curved road. In so doing, the controller 24 prevents the host vehicle 22 from accelerating when a target vehicle is no longer detected due to the curvature of the road, thereby, preventing a collision between the host vehicle 22 and the target vehicle.

Applicants admit that the prior art has included a system for adjusting steering angle in response to vehicle speed. What is not known or suggested are the several novel limitations recited in claims 11 and 19 and associated aspects thereof, which are utilized in combination. All of the novel limitations of claims 11 and 19 are not taught or suggested by the prior art separately or in combination. The novel limitations of claims 11 and 19 that are not taught or suggested are stated as such above with respect to claims 1 and 16.

Claim 13 recites the method of claim 11 wherein detecting a non-planned future path of the automotive vehicle 22 is in response to a navigation signal. See pages 10-11, paragraphs [0028] and [0029].

Claim 14 recites the method of claim 11 and further includes adjusting the automotive vehicle speed in response to the object profile and the predicted future path profile to avoid a stopped object. See pages 15, 19-20, paragraphs [0034], [0038], and [0039].

Claim 15 recites the method of claim 11 wherein the controller 24 in response to the object profile and the predicted future path profile signals a warning system 42. See pages 10-11 and 13-15, paragraphs [0029] and [0037].

VI Grounds of Rejection to be Reviewed on Appeal

The following issues are presented in this appeal, which correspond directly to the Examiner's final grounds for rejection in the Final Office Action dated February 4, 2005, hereinafter referred to as the "Final Office Action":

(1) whether claims 1-15 are patentable under 35 U.S.C. 112, first paragraph,

(2) whether claims 1-11, and 16-19 are patentable under 35 U.S.C. 103(a) over Kageyama et al. (USPN 6,246,932) in view of Sielagoski et al. (6,212,465), and

(3) whether claims 13-15 are patentable under 35 U.S.C. 103(a) over Sielagoski in view of Kageyama.

VII Argument

A. THE REJECTION OF CLAIMS 1-15 UNDER 35 U.S.C. § 112

Claims 1-15 stand fully rejected under §112, first paragraph, as failing to comply with the enablement requirement. Note that it is unclear from the Advisory Action of April 12, 2005 whether claims 1-15 remain rejected under 35 U.S.C. §112. Nevertheless, Applicants provide arguments below, which overcome the stated rejection, as similarly and previously provided in the Response to the Final Office Action.

The Examiner, in the Office Action, poses the question, how can a method and/or system detect something that is in the future and it has not happened yet? Lacking an answer to this question or an understanding as to what is meant by the term "non-planned future path", the Examiner, for this reason alone, finds the present disclosure to not be enabling to one skilled in the art. Applicants in the Final Office Action amended claims 1 and 11 to recite "predicting a non-planned future path", as opposed to reciting "detecting a non-planned future path" to

further clarify what is meant by the term "detecting" in the associated limitations. Applicants submit that regardless of this amendment this is clearly implied by the claims and the specification of the present application. For example, claims 1 and 11 both recite generating a predicted future path profile in response to the non-planned future path, in other words a non-planned future path is predicted. In the specification of the present application it is stated that a future path profile may include road paths and other related information. See pages 17-18, paragraph [0037] of the specification. As another example, the specification states that the navigation system 34 may be utilized to provide a more accurate future road path prediction. See pages 12-13, paragraph [0032] of the specification. The specification also states that inhibit resume mode allows the vehicle 22 to reasonably predict straight roads and steady state curves and speaks of estimated road curvature prediction. See pages 13-15, paragraph [0033]. Throughout the present application path prediction is discussed.

Applicants submit that a system 20 can detect or predict a future path of a vehicle 22, that the specification of the present application clearly provides such enablement, and that one skilled in the art upon reviewing the specification would clearly understand how to make and/or use the claimed invention.

The Applicants have submitted that the term "non-planned future path" refers to a future path that is not predetermined or planned. In other words, a non-planned future path is not predetermined and stored in a memory and later recalled to guide a vehicle. A non-planned future path is an upcoming path that may be detected or predicted. In detecting a future path, a system may predict a future speed, acceleration/deceleration, and heading of a vehicle, as well as whether a vehicle is to change lanes, enter an exit ramp, or other future path related information.

The specification of the present application clearly provides enablement for detecting or predicting a non-planned future path of a vehicle. In paragraphs [0026]-[0033] of the specification various parameters and characteristics of a vehicle

and its surrounding environment are detected, received, and determined. These parameters and characteristics enable a system to detect or predict a vehicle future path. The specification provides for the detection of vehicle velocity, speed, acceleration, deceleration, yaw rate, position, and location. The specification also provides for the detection of objects and characteristics thereof. A navigation signal is also provided, received, and may include vehicle position, location, future vehicle path, landmarks, construction zones, road curvature, number of lanes, road type, road inclination, and road condition. In addition, modes of operation are also initiated. These various parameters and characteristics utilized in various combinations allow a system to monitor the behavior of a vehicle operator, to monitor a current situation in which a vehicle is operating, to monitor a current roadway and impending roadways, and to monitor the manner in which that vehicle is currently being operated. The stated monitoring allows the system to predict a future path of a vehicle without having prior knowledge of that path.

A couple of examples provided in paragraphs [0029], [0032], [0033], and [0035]-[0039] of the specification are summarized below. As a first example, by detecting the yaw rate and speed of a vehicle and roadway parameters, such as the number of lanes, the existence of a ramp, etc., a system can predict whether the vehicle will remain in the current lane, change lanes, enter an exit ramp, etc. As another example, in detecting vehicle yaw rate, speed, and acceleration, and the existence of objects and there relation to the vehicle, a system can predict the future direction or heading of a vehicle.

Thus, the specification openly and undoubtedly provides adequate disclosure to enable one skilled in the art to make and/or use the claimed invention. Referring to MPEP 2164, as long as the specification discloses at least one method for making or using the claimed invention that bears a reasonable correlation to the entire scope of the claim, then the enablement requirement of 35 U.S.C. 112 is satisfied. See *In re Fisher*, 427 F.2d 833, 839, 166 USPQ 18, 24 (CCPA 1970). The

present specification provides several examples, and provides the components and systems to detect and determine the above-stated parameters and characteristics.

The test for enablement is whether one reasonably skilled in the art could make or use the invention without undue experimentation. See *In re Wands*, 858 F.2d at 737, 8 USPQ2d at 1404 (Fed. Cir. 1988). A patent need not teach, and preferably omits, what is well known in the art. See *In re Buchner*, 929 F.2d 660, 661, 18 USPQ2d 1331, 1332 (Fed. Cir. 1991). Also, the fact that experimentation may be complex does not necessarily make it undue, if the art typically engages in such experimentation. See *In re Certain Limited-Charge Cell Culture Microcarriers*, 221 USPQ 1165, 1174. Applicants submit that the claimed invention may be used in light of the specification without experimentation.

Furthermore, Applicants submit that the specification teaches the manner and process of using the claimed invention in terms which correspond in scope to those used in describing and defining the subject matter sought to be patented and thus must be taken as being in compliance with the enablement requirement. Thus, the present specification is enabling with respect to claims 1 and 11 and therefore the 35 U.S.C. 112 rejection has been overcome. As a result, Applicants submit that claims 1 and 11 and claims 2-10 and 13-15, since they depend from claims 1 and 11, are in a condition for allowance with respect to 35 U.S.C. 112.

In addition, Applicants submit that for the above and below stated reasons that the 35 U.S.C. 112 rejection was unsubstantiated. The Examiner has not provided any reason to doubt the objective truth of the statements contained within the specification. The Examiner has also not provided any specific technical reasons as required to support a *prima facie* case of lack of enablement. See *In re Marzocchi*, 439 F.2d 220, 224, 169 USPQ 367,370 (CCPA 1971).

B. THE REJECTION OF CLAIMS 1-11 and 16-19 UNDER 35 U.S.C. § 103(a)

Claims 1-11 and 16-19 stand fully rejected as being unpatentable under 35 U.S.C. 103(a) over Kageyama in view of Sielagoski.

Kageyama is directed towards a vehicle monitor 20 for controlling the movements of multiple vehicles 11-13. The vehicles 11-13 are controlled from the remotely located monitoring station 20 via communication signals transmitted and received between the monitoring station 20 and the vehicles 11-13.

Sielagoski is directed towards a system 10 for controlling vehicle speed based on yaw rate. The system 10 of Sielagoski adjusts vehicle speed in response to yaw rate.

Note that the Office Actions have relied on Kageyama for the disclosure of each and every limitation of claims 1, 11, 16, and 19, except for that of sensing yaw rate, generating a yaw rate signal, and inhibiting a resume speed of a vehicle in response to a yaw rate signal.

With respect to claim 1, 11, 16, and 19, Applicants submit that Kageyama fails to teach or suggest the following limitations: A) detecting a non-planned future path of a vehicle; B) detecting a non-planned future path via a navigation system; C) generating a predicted future path profile; D) generating a predicted future path profile in response to a non-planned future path; E) inhibiting resume speed of a vehicle by preventing acceleration of the vehicle; F) performing such inhibition in response to a non-planned future path; G) performing such inhibition in response to a predicted future path profile; and H) performing such inhibition via an in-vehicle controller. Applicants further submit that Sielagoski also fails to teach or suggest limitations A-D, F, and G, as admitted in the Final Office Action.

With respect to limitations A and B, Kageyama does not teach or suggest detecting a non-planned future path of a vehicle. The Office Actions have stated that Kageyama teaches using a planned traveling path and that the planned traveling path is well understood. Applicants agree. However a planned traveling

path is clearly different than a detected or predicted non-planned future path. The planned traveling path of Kageyama is predetermined by the monitoring station 20, whereas the future path of claims 1 and 16 are determined and predicted using a navigation system 34. This is reinforced by the limitation of generating a predicted future path profile. The monitoring station 20 of Kageyama does not detect a future path of a vehicle in response to a navigation signal, such as one generated by a global positioning system, but rather has a planned path that is predetermined. The monitoring station 20 simply directs a vehicle of concern to follow a predetermined path in response to the relative location of other monitored vehicles. The monitoring station 20 at any given moment in time does not determine or predict a future path of a vehicle, the path is already known.

With respect to limitations C and D, the Office Actions state that Kageyama teaches generating a predicted future path profile in response to a non-planned future path and refers to col. 11, lines 26-30 of Kageyama, which also disclose a planned traveling path. Kageyama does not generate a predicted future path profile, but rather follows a predetermined traveling path. The controllers of claims 1 and 16 generate a predicted future path profile in response to a currently detected future path, not a predetermined traveling path, of the vehicle 22. Note that the Office Actions have referred to a predetermined traveling path for both the future path and the predicted future path profile, which are clearly not the same. A future path refers to a future trail, lane, course, or route that will be taken. A future path profile includes the future path and other related information, such as object profiles, vehicle yaw rates, street categories, etc. Although the monitoring station 20 of Kageyama utilizes a planned path of vehicles 11-13, the monitoring station 20 is at a remote location from the vehicles 11-13 and the monitoring station 20 does not perform a prediction. The planned path is predetermined and stored for use by the monitoring station 20.

Sielagoski, like Kageyama, also fails to teach or suggest limitations A-D. Nowhere in Sielagoski is a non-planned future path of a vehicle taught or suggested. Sielagoski simply adjusts vehicle speed based on yaw rate, range, and relative speed. Since Sielagoski fails to suggest a non-planned future path of a vehicle, Sielagoski clearly fails to teach or suggest any of limitations A-D.

With respect to limitations E and H, the Office Action of February 10, 2004, correctly stated that Kageyama does not specify resume speed. Kageyama does not mention, set, determine, or inhibit a resume speed of a vehicle nor does Kageyama teach or suggest the use of an in-vehicle controller to inhibit the resume speed of a vehicle. The Final Office Action of September 12, 2003 states that Kageyama has at least one in-vehicle controller that performs this function when it receives the information from the vehicle running ahead, and refers to col. 9, lines 47-51 of Kageyama. In col. 9, lines 47-51, Kageyama discloses stopping and reducing the speed of a vehicle in response to directive data received from the monitoring station 20. Kageyama does not teach or suggest the use of an in-vehicle controller for adaptively controlling the speed of a vehicle. In Kageyama, vehicle control signals are transmitted from the monitoring station 20 to the vehicles 11-13. Clearly reducing the speed of vehicle is not the same as preventing the acceleration of a vehicle. The vehicle controller 35 of Kageyama, shown in Figure 3, receives signals from the monitoring station 20 and in response thereto stops or reduces speed of the vehicles 11-13. Although the controller 35 may be used in controlling the speed of a vehicle, nowhere in col. 9, lines 47-51 or anywhere else in Kageyama is a resume speed, inhibition of a resume speed, prevention of acceleration, or inhibition of a resume speed by an in-vehicle controller mentioned or suggested, and clearly not in response to a predicted future path profile, as described above.

With respect to limitations F and G, the Office Actions further state that Kageyama teaches inhibiting the speed of a vehicle in response to a predicted future path profile. Since Kageyama does not teach or suggest the detection of a future path or the generation of a predicted future path profile of a vehicle, Kageyama also

does not teach or suggest the inhibition of the resume speed of a vehicle in response thereto.

With respect to limitations E, G, and H, the monitoring station 20 of Kageyama controls the speed of the vehicles 11-13 of Kageyama from a remote location. The claimed invention controls the acceleration of a vehicle 22 from a controller 24 within the vehicle 22. The vehicle control signals of Kageyama that originate from the monitoring station 20, are clearly different than that of the claimed invention.

Sielagoski, like Kageyama, also fails to teach or suggest limitations F and G. The Final Office Action states that Sielagoski discloses generating a yaw rate signal and preventing acceleration of the vehicle in response to the yaw rate signal. In so doing, the Final Office Action refers to col. 1, lines 42-60, of Sielagoski. Applicants submit that although Sielagoski may disclose the generation of a yaw rate signal and the inhibiting of the acceleration of a vehicle, Sielagoski does not prevent the acceleration of a vehicle in response to a non-planned future path and in response to a predicted future path profile. This is evident since Sielagoski does not detect a future path of a vehicle.

Since Kageyama and Sielagoski alone or in combination fail to teach or suggest each and every limitation of claims 1, 11, 16, and 19, Applicants submit that the *prima facie* case of obviousness has not been met. See MPEP 706.02(j) and 2143, which states that to establish a *prima facie* case of obviousness the prior art reference(s) must teach or suggest all the claim limitations. See *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Referring to MPEP 2141.01(a), while the Patent Office classification of references and cross-references in the official search notes are some evidence of "nonanalogy" or "analogy" respectively, the court has found "the similarities and differences in structure and function of the inventions to carry far greater weight." *In re Ellis*, 476 F.2d 1370, 1372, 177USPQ526, 527 (CCPA 1973). Kageyama would not have logically commended itself to an inventor's attention in considering the

problems solved by the method and systems of claims 1, 11, 16, and 19. In developing an adaptive onboard control method for controlling the speed of an automotive vehicle for incorporation into an adaptive cruise control system, one would clearly not look to a vehicle monitor within a remotely located monitoring station. As stated, the monitoring station 20 of Kageyama monitors remote vehicles 11-13 and directs a vehicle of concern to follow a predetermined path in response to the relative location of other monitored vehicles and a pre-planned route. The monitoring system 20 of Kageyama would not have logically commended itself to the Applicants' attention in solving the problems associated with adaptive cruise control and for adaptively controlling a vehicle via an in-vehicle controller. Kageyama would not be reasonably pertinent to the particular problems solved by the method and systems of claims 1, 11, 16, and 19.

Also, it would not have been obvious to one of skill in the art to combine and modify the teachings of Kageyama and Sielagoski, as is necessary, to arrive at the claimed invention. Referring to MPEP 2141.01, while Patent Office classification of references and cross-references are some evidence of "nonanalogy" or "analogy" respectively, the court has found "the similarities and differences in structure and function of the invention to carry far greater weight", *In re Ellis*, 476 F.2d 1370, 1372, 177 USPQ 526, 527. Kageyama is directed to the remote monitoring of vehicles not to onboard adaptive cruise control systems. Since Kageyama, as stated above, is nonanalogous art it would not have been obvious to combine the teachings of Kageyama with that of Sielagoski. In addition, since Kageyama and Sielagoski fail to teach or suggest each and every element of claims 1, 11, 16, and 19, since there is no motivation provided to combine and modify the stated references to arrive at the claimed invention, and since claims 2-10, 13-15, and 17-18 depend from claim 1, 11, and 16, respectfully, it would also not have been obvious to combine and modify the stated references to arrive at the claimed invention of claims 2-10, 13-15, and 17-18. Besides the combination thereof does not teach or suggest each and every element claimed.

The Final Office Action, with respect to the Applicants' arguments for the failure of the prior art to teach or suggest the generating of a predicted future path profile and the inhibiting of a resume speed of a vehicle via an in-vehicle controller, states that Applicants' admitted prior art in combination with Kageyama provides such disclosure. The Final Office Action refers to page 5, paragraph [0027], where the specification of the present application states "other detection methods known in the art" in reliance on Applicants' admitted prior art. Applicants, respectfully, traverse. Applicants submit that the recital of "other detection methods known in the art" is irrelevant and unrelated to the argued claim limitations and is not admitted prior art.

The stated text is part of the sentence, "Although the detection system 28 of the present invention is radar based the detection system 28 may be laser based, infrared based, x-ray based, or based off other detection methods known in the art." The stated text refers to the detection system 28 not the controller 24. The limitations recite the generating of a predicted future path profile and the inhibiting of the resume speed via an in-vehicle controller. The argued limitations do not recite a detection system or the basis of the detection system. Also, the stated text does not mention generating a predicted future path profile or the inhibiting of a resume speed. The stated tasks are performed by the controller 24 not by the detection system 28.

Applicants submit that the stated text is not admitted prior art, but rather simply suggests that the detection system 28 may be based off of various technologies and is not limited to those mentioned. The specification then states how the stated technologies are utilized to provide an object profile. Providing an object profile via a detection system is also clearly different and separate from generating a predicted future path profile and inhibiting resume speed via an in-vehicle controller. Also, note that the stated text is in the Detailed Description section, which does not contain any admitted prior art, and not in the Background section of the present application.

Thus, the assertion that Kageyama's invention is known in the art and the correlation thereof with the stated text is improper and irrelevant. In addition, Applicants submit that to combine the teachings of the present application with that of a prior art reference is improper and would be improper use of hindsight in view of the present application. Nevertheless, such correlation or combination does not teach or suggest the argued claimed limitations. The stated text may infer that the detection system 28 of the present application may be radio based, such as the radio communication used in Kageyama to detect objects and determine an object profile. However, the stated text does not infer or admit that the detection system 28 or the methods in which the detection system 28 is used is prior art. Also, the combination of Kageyama with the disclosure provided in the present application, specifically of a detection system that may be based on various technologies, does not teach or suggest the generating of a predicted future path profile and the inhibiting of a resume speed of a vehicle via an in-vehicle controller. This is especially true since the detection system 28 does not perform the stated tasks.

In response to Applicants arguments regarding Kageyama being nonanalogous art, the Office Action states that the prior art reference must be reasonably pertinent to the particular problem with which the applicant was concerned and refers to *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). Applicants agree. However, Applicants submit that Kageyama is not reasonably pertinent to the particular problem with which Applicants were concerned. Applicants have stated that in developing an adaptive onboard control method for controlling the speed of an automotive vehicle for incorporation into an adaptive cruise control system, one would clearly not look to a vehicle monitor within a remotely located monitoring station. Also as stated, the monitor station 20 of Kageyama monitors remote vehicles 11-13 and directs a vehicle of concern to follow a predetermined path in response to the relative location of other monitored vehicles and a pre-planned route. The monitoring system 20 of Kageyama would not have logically commended itself to the Applicants' attention in solving the

problems associated with adaptive cruise control and for adaptively controlling a vehicle via an in-vehicle controller.

Applicants further submit that *Oetiker* also states that the courts have recognized the subjective aspects of determining whether an inventor would reasonably be motivated to look to the field in which the examiner found the reference, in order to solve the problem confronting the inventor. The court has reminded the PTO that it is necessary to consider "the reality of the circumstances". In other words, common sense dictates which fields a person of ordinary skill would reasonably be expected to look for a solution to the problem facing the inventor. Also, *Oetiker* states that the combination of elements from non-analogous sources, in a manner that reconstructs the Applicants' invention only with the benefit of hindsight, is insufficient to present a *prima facie* case of obviousness. There must be some reason, suggestion, or motivation, found in the prior art whereby a person of ordinary skill in the field of the invention would make the combination. That knowledge cannot come from Applicants' invention itself. In addition, simplicity is not inimical to patentability.

In *Oetiker* it was found that although the prior art separately disclosed the elements of the claimed invention and although both references were related to fasteners that the reference disclosing the plastic hook and eye fastener was nonanalogous art. The court stated that fasteners that are used in garment art are unrelated to hose clamps, although both being a type of fastener. Therefore, all fastener problems are not analogous.

Similarly, Applicants submit that all vehicle control system problems are not analogous. Although Kageyama discloses a vehicle control system, the vehicle control system is exhibited by a remote monitoring station, which is used to guide construction trucks within a construction site. The art of remotely guiding trucks on a construction site is clearly nonanalogous to the art of internally controlling the operation of an automotive vehicle on a roadway.

Applicants also note that the claims should be construed in light of the specification. See *Ex parte Kotler*, 1901 C.D. 62, 95 O.G. 2684 (Comm'r Pat. 1901) and *In re Morris*, 127 F.3d 1048, 1054, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997). Thus, it was not the intent of the Applicants that the method of adaptively controlling the speed of a vehicle refer to the remote monitoring and guiding of construction site vehicles, but rather to automotive in-vehicle controllers for individual on road operation. In developing an adaptive cruise control system one would not look to a system for remote monitoring and control of construction site vehicles. The system of Kageyama would not have logically presented itself to one of skill in the art in solving the problems associated with adaptive cruise control systems. A person of ordinary skill in the art of adaptive cruise control systems would not reasonably look to the art of construction site operation. Applicants submit that the remote or broadly suggested connection between Kageyama and the present invention due simply based on both dealing with vehicle control is far-reaching and inappropriate. Furthermore, there is no reason, suggestion, or motivation, found in the prior art whereby a person of ordinary skill in the field of the invention would make the necessary modifications and combination.

Thus, Applicants submit that claims 1, 11, 16, and 19 are believed to be independently patentable and allowable for the reasons set forth above.

Claim 2 is believed to be independently patentable and allowable for the reasons set forth above since it depends from claim 1 and further recites continuously updating the predicted future path profile. Kageyama and Sielagoski, alone or in combination, fail to teach or suggest this combination. Since neither reference teaches or suggests the generation of a predicted future path profile, neither reference teaches or suggests the continuous updating thereof.

Claim 3 is believed to be independently patentable and allowable for the reasons set forth above since it depends from claim 2 and further recites wherein updating the predicted future path profile includes updating parameters selected from: an object profile, a yaw rate, a street category, and upcoming future road

paths. Kageyama and Sielagoski, alone or in combination, fail to teach or suggest this combination. Since neither reference teaches or suggests the generation of a predicted future path profile, neither reference teaches or suggests the updating thereof.

Claim 4 is believed to be independently patentable and allowable for the reasons set forth above since it depends from claim 1 and further recites determining that the object is a stopped object, adjusting automotive vehicle speed in relation to the stopped object, and maintaining a safe operating distance between the automotive vehicle 22 and the stopped object. Kageyama and Sielagoski, alone or in combination, fail to teach or suggest this combination.

Claim 5 is believed to be independently patentable and allowable for the reasons set forth above since it depends from claim 1 and further recites assuming a future road condition to have a road curvature, a speed category, a number of lanes, or a road inclination that is the same as a present road condition. Kageyama and Sielagoski, alone or in combination, fail to teach or suggest this combination. Since neither reference teaches or suggests detecting a non-planned future path or generating a predicted future path profile, neither reference teaches or suggests performing such an assumption. No assumption is needed in the system of Kageyama since vehicle paths are predetermined, known, and stored. Sielagoski does not teach or suggest following a path let alone whether that path is predetermined or whether an assumption as claimed is realized.

Claim 6 is believed to be independently patentable and allowable for the reasons set forth above since it depends from claim 1 and further recites wherein detecting the non-planned future path of the automotive vehicle 22 includes sensing yaw rate of the automotive vehicle 22 and generating a yaw rate signal, relating the yaw rate to a road curvature, and inhibiting resume speed of the automotive vehicle 22 in response to the yaw rate signal. Kageyama and Sielagoski, alone or in combination, fail to teach or suggest this combination.

Claim 7 is believed to be independently patentable and allowable for the reasons set forth above since it depends from claim 1 and further recites wherein detecting the non-planned future path of the automotive vehicle 22 includes using a navigation system 34 to generate a navigation signal using information selected from: an automotive vehicle position, a speed category, a future path of the automotive vehicle 22, a landmark location, a road curvature, an overhead object location, a bridge location, a construction zone, a number of lanes, a road type, and a road inclination. Kageyama and Sielagoski, alone or in combination, fail to teach or suggest this combination. Since neither reference teaches or suggests detecting a non-planned future path, neither reference teaches or suggests the tasks, systems, or components, involved in performing such detection.

Claim 8 is believed to be independently patentable and allowable for the reasons set forth above since it depends from claim 1 and further recites wherein generating an object profile includes storing object parameters selected from: relative distance from the automotive vehicle 22, object location relative to a road, and velocity of the object relative to the automotive vehicle velocity. Kageyama and Sielagoski, alone or in combination, fail to teach or suggest this combination.

Claim 9 is believed to be independently patentable and allowable for the reasons set forth above since it depends from claim 1 and further recites wherein generating a predicted future path profile further includes determining object location with respect to the non-planned future path. Kageyama and Sielagoski, alone or in combination, fail to teach or suggest this combination. Since neither reference teaches or suggests the generation of a predicted future path profile, neither reference teaches or suggests the tasks involved in performing such generation.

Claim 10 is believed to be independently patentable and allowable for the reasons set forth above since it depends from claim 1 and further recites wherein inhibiting the resume speed of the automotive vehicle 22 further includes inhibiting resume speed of the automotive vehicle 22 in response to a parameter selected from:

a road curvature, a speed category, a number of lanes, and a constant road inclination. Kageyama and Sielagoski, alone or in combination, fail to teach or suggest this combination.

Claim 17 is believed to be independently patentable and allowable for the reasons set forth above since it depends from claim 16 and further recites wherein the controller 24 in generating a predicted future path profile determines an object location with respect to the non-planned future path. Kageyama and Sielagoski, alone or in combination, fail to teach or suggest this combination. Since neither reference teaches or suggests the generation of a predicted future path profile, neither reference teaches or suggests the continuous updating thereof.

Claim 18 is believed to be independently patentable and allowable for the reasons set forth above since it depends from claim 16 and further recites wherein the controller 24 determines the object to be a stopped object and adjusts the speed of the automotive vehicle 22 in relation to the stopped object. Kageyama and Sielagoski, alone or in combination, fail to teach or suggest this combination.

C. THE REJECTION OF CLAIMS 13-15 UNDER 35 U.S.C. § 103(a)

Claims 13-15 stand fully rejected as being unpatentable under 35 U.S.C. 103(a) over Sielagoski in view of Kageyama.

Applicants submit that since claims 13-15 depend from claim 11 that they are also independently patentable and allowable for at least the same reasons.

Claim 13 is believed to be independently patentable and allowable for the reasons set forth above since it depends from claim 11 and further recites wherein detecting a non-planned future path of the automotive vehicle 22 is in response to a navigation signal. Sielagoski and Kageyama, alone or in combination, fail to teach or suggest this combination. Since neither reference teaches or suggests the detection of a non-planned future path, neither reference teaches or suggests how such detection is performed.

Claim 14 is believed to be independently patentable and allowable for the reasons set forth above since it depends from claim 11 and further recites adjusting the automotive vehicle speed in response to the object profile and the predicted future path profile to avoid a stopped object. Sielagoski and Kageyama, alone or in combination, fail to teach or suggest this combination. Since neither reference teaches or suggests the generation of a predicted future path profile, neither reference teaches or suggests performing tasks in response thereto.

Claim 15 is believed to be independently patentable and allowable for the reasons set forth above since it depends from claim 11 and further recites wherein the controller 24 in response to the object profile and the predicted future path profile signals a warning system 42. Sielagoski and Kageyama, alone or in combination, fail to teach or suggest this combination. Since neither reference teaches or suggests the generation of a predicted future path profile, neither reference teaches or suggests performing tasks in response thereto.

VIII Appendix

A copy of the claims involved in this Appeal, namely claims 1-11 and 13-19, is attached hereto as Appendix A.

IX Conclusion

For the reasons advanced above, Appellants respectfully contend that each claim is patentable. Therefore reversal of the rejection is requested.

Respectfully submitted,

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APPENDIX A

What is claimed is:

1. A method of adaptively controlling the speed of an automotive vehicle having a controller comprising:

detecting an object and generating an object profile;

generating a navigation signal via a navigation system;

detecting a non-planned future path of the automotive vehicle in response to said navigation signal;

generating a predicted future path profile via the controller in response to said non-planned future path and said object profile; and

inhibiting a resume speed of the automotive vehicle by preventing acceleration of the automotive vehicle in response to said predicted future path profile and a command originated and generated by the controller.

2. A method as in claim 1 further comprising continuously updating said predicted future path profile.

3. A method as in claim 2 wherein updating said predicted future path profile includes updating parameters selected from the following group comprising: object profile, yaw rate, street category, and upcoming future road paths.

4. A method as in claim 1 further comprising:

determining that said object is a stopped object;

adjusting automotive vehicle speed in relation to said stopped object; and

maintaining a safe operating distance between the automotive vehicle and said stopped object.

5. A method as in claim 1 further comprising assuming a future road condition selected from the following group comprising: road curvature, speed category, number of lanes, and road inclination is the same as a present road condition.

6. A method as in claim 1 wherein ~~detecting~~ predicting the non-planned future path of the automotive vehicle comprises:

sensing yaw rate of the automotive vehicle and generating a yaw rate signal;

relating said yaw rate to road curvature; and

inhibiting resume speed of the automotive vehicle in response to said yaw rate signal.

7. A method as in claim 1 wherein ~~detecting~~ predicting the non-planned future path of the automotive vehicle comprises using a navigation system to generate a navigation signal including information selected from the following group comprising: automotive vehicle position, speed category, future path of the automotive vehicle, landmark location, road curvature, overhead object location, bridge location, construction zone, number of lanes, road type, and road inclination.

8. A method as in claim 1 wherein generating an object profile comprises storing object parameters selected from the following list comprising: relative distance from the automotive vehicle, object location relative to a road, and velocity of said object relative to the automotive vehicle velocity.

9. A method as in claim 1 wherein generating a predicted future path profile further comprises determining object location with respect to the non-planned future path.

10. A method as in claim 1 wherein inhibiting the resume speed of the automotive vehicle further comprises inhibiting resume speed of the automotive vehicle while a present parameter selected from the following group comprising: road curvature, speed category, number of lanes, and road inclination remains constant.

11. A method of adaptively controlling the speed of an automotive vehicle having a controller comprising:

detecting an object and generating an object profile;

detecting a non-planned future path of the automotive vehicle and generating a predicted future path profile via the controller;

assuming a future road condition to be the same as a present road condition;

sensing yaw rate of the automotive vehicle;

generating a yaw rate signal; and

inhibiting a resume speed of the automotive vehicle by preventing acceleration of the automotive vehicle in response to said object profile, said assumption, said predicted future path profile, said yaw rate signal, and a command originated and generated by the controller.

13. A method as in claim 11 wherein ~~detecting~~ predicting a non-planned future path of the automotive vehicle is in response to a navigation signal.

14. A method as in claim 11 further comprising adjusting the automotive vehicle speed in response to said object profile and said predicted future path profile to avoid a stopped object.

15. A method as in claim 11 further comprising signaling a warning system in response to said object profile and said predicted future path profile.

16. A control system for an automotive vehicle comprising:

a detection system detecting an object, said detection system generating a object profile;

a navigation system generating a navigation signal; and

an in-vehicle controller electrically coupled to said detection system and said navigation system, said controller in response to said object profile and said navigation signal, generating a predicted future path profile and inhibiting resume speed of the automotive vehicle by preventing acceleration of the automotive vehicle in response to said predicted future path profile and a command originated and generated by the controller.

17. A system as in claim 16 wherein said controller in generating a predicted future path profile determines an object location with respect to the non-planned future path.

18. A system as in claim 16 wherein said controller determines said object to be a stopped object and adjusts the speed of the automotive vehicle in relation to said stopped object.

19. A control system for an automotive vehicle comprising:

a radar system detecting an object, said radar system generating an object profile;

a navigation system generating a navigation signal;

a yaw rate sensor sensing yaw rate of the automotive vehicle, said yaw rate sensor generating a yaw rate signal; and

an in-vehicle controller electrically coupled to said radar system, said navigation system, and said yaw rate sensor, said controller in response to said object profile and said navigation signal generating a predicted future path profile and inhibiting resume speed of the automotive vehicle by preventing acceleration of the automotive vehicle in response to said predicted future path profile, said yaw rate signal, and a command originated and generated by the controller.

1FW AF

PTO/SB/17 (12-04)
Approved for use through 07/31/2006. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Effective on 12/08/2004.
Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL
For FY 2005

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 500.00

Complete if Known	
Application Number	10/063,498
Filing Date	April 30, 2002
First Named Inventor	Farid Ahmed-Zaid, et al.
Examiner Name	Olga Hernandez
Art Unit	3661
Attorney Docket No.	199-1941 (FGT 1503 PA)

METHOD OF PAYMENT (check all that apply)

☐ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): ____________

☑ Deposit Account Deposit Account Number: 06-1510 Deposit Account Name: Ford Motor Company

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

☑ Charge fee(s) indicated below ☐ Charge fee(s) indicated below, **except for the filing fee**

☑ Charge any additional fee(s) or underpayments of fee(s) under 37 CFR 1.16 and 1.17 ☑ Credit any overpayments

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

Application Type	FILING FEES Fee ($)	FILING FEES Small Entity Fee ($)	SEARCH FEES Fee ($)	SEARCH FEES Small Entity Fee ($)	EXAMINATION FEES Fee ($)	EXAMINATION FEES Small Entity Fee ($)	Fees Paid ($)
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	Fee ($)	Small Entity Fee ($)
Each claim over 20 or, for Reissues, each claim over 20 and more than in the original patent	50	25
Each independent claim over 3 or, for Reissues, each independent claim more than in the original patent	200	100
Multiple dependent claims	360	180

Total Claims ______ - 20 or HP = **Extra Claims** ______ x **Fee ($)** ______ = **Fee Paid ($)** ______

HP = highest number of total claims paid for, if greater than 20

Indep. Claims ______ - 3 or HP = **Extra Claims** ______ x **Fee ($)** ______ = **Fee Paid ($)** ______

HP = highest number of independent claims paid for, if greater than 3

Multiple Dependent Claims **Fee ($)** ______ **Fee Paid ($)** ______

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets ______ - 100 = **Extra Sheets** ______ / 50 = **Number of each additional 50 or fraction thereof** ______ (round up to a whole number) x **Fee ($)** ______ = **Fee Paid ($)** ______

4. OTHER FEE(S) **Fees Paid ($)**

Non-English Specification, $130 fee (no small entity discount) ______

Other: Appeal Brief 500.00

SUBMITTED BY

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